

## BOAT CARRYING RACK FOR USE ON TRANSPORTING VEHICLES

### Cross reference to related application

This application claims the benefit of Provisional Application Serial No. 60/463,815, filed April 18, 2003.

### Field of the Invention

This invention relates to carrier accessories for transporting small boats on vehicles and more particularly to boat carrier racks for use on all terrain vehicles (ATV's) and pickup trucks.

### Background of the Invention

All terrain vehicles, as the name indicates, provide an attractive means for transporting various objects to remote locations which are inaccessible to other types of vehicles. ATV's normally are equipped with front and rear racks suitable for carrying small objects which may be placed on a rack and secured as necessary. Elongated objects such as small boats or canoes useful for fishing or duck hunting at remote locations would require additional support that is not provided by standard equipment in the form of front and rear racks.

Various accessory racks have been developed for supporting objects such as rifles, tree stands and hoisting equipment on ATV's, these racks normally being connected to only the existing rear rack. A canoe carrier system connected to both the front and rear racks of an ATV is disclosed in U. S. Patent No. 6,126,052, issued to Toivola on October 3, 2000. The system

this patent includes four vertical support members, one at each corner and a pair of elongated support members at the top. It would be desirable to provide a small boat carrier rack attachable to an ATV, but using fewer structural members where this can be done without loss of strength or function, thus reducing weight and the number of dead spots obstructing vision of a driver. Other desirable features would be to provide for adjustability of dimensions in all directions and to include additional protection against movement of a supported boat. Many of these criteria are also applicable to carrier racks mounted on pickup trucks.

#### Summary of the Invention

The present invention is directed to an accessory rack for carrying objects such as small boats on an ATV or other vehicles providing a suitable platform for mounting the rack, in particular pickup trucks having a conventional bed. The accessory rack includes a front end assembly and a rear end assembly in facing relation, each of the assemblies having a bottom base member adapted to be connected across an existing rack on a an ATV, an upright post connected to the base member at a central location thereof and a horizontal boat-receiving cross member connected at a central location to the top of the post, the front and rear assemblies being connected to one another by an elongated beam aligned coplanar with the upright posts. The cross members preferably have a portion at each end bent upwards to form a U-shaped cradle effective to keep a transported object from sliding off a side of the rack. All structural components listed above are preferably made of square steel tubing, with certain portions having dimensions different from one another so as to

enable size adjustments as explained below. To provide maximum strength of the assembled device gussets may be incorporated at all joints between structural members. Tie-down straps, threaded through openings in a bracket connected to structural members at appropriate locations, are provided to hold a transported boat down.

Boat carrier racks embodying the invention provide important advantages in their light weight, resulting from use of a minimum of structural members without adversely affecting strength or performance of the device, and in their capability for being easily adjusted in size for different loads.

#### Brief Description of the Drawings

Fig. 1 is a perspective view, taken from above, of a boat carrier rack for use on an ATV or a pickup truck.

Fig. 2 is a perspective view of a carrier rack installed on an ATV base.

Fig. 3 is a perspective view, partly broken away, showing more details of the carrier rack.

Fig. 4 is an enlarged fragmentary view showing details of a connection of an upward extending arm to the rack.

Fig. 5 is a view showing attachment of a boat-transporting rack to a pickup truck bed.

#### Description of the Preferred Embodiment

Referring to Fig. 1 of the drawings, there is shown a boat carrier rack 10 comprising a rear support assembly 12, a front support assembly 14 and an elongated beam 16 connecting the two assemblies. Each of the assemblies has a base member 18, 18a extending across the width of the device, an upper

cross member 20, 20a bent upward at ends 22, 22a to form a cradle in which a boat or other object is received, the base member and the upper cross member being connected by a vertical post 24. 24a. Joints between the vertical posts, cross members and the elongated beam are preferably reinforced by providing triangular gussets 26, 26a or rectangular plates 28, 28a at each joint.

In order to enable use of a minimum number of structural elements, consistent with necessary strength, the basic structural components of the rack are preferably comprised of square metal tubing made of steel or other high-strength metal. In addition, by selection of tubing having different sizes at adjacent locations, end portions of tubing parts may be slid into one another, enabling adjustment of length dimensions of the respective parts.

Although the invention is not to be understood as limited to specific dimensions, the base members 18, 18a of the end assemblies may comprise a single piece of 1 and 1/2 inch square metal tubing having a length of 43 inches for the rear assembly 12 and 33 inches for the front assembly 14, these different lengths accommodating differences in front and rear racks as installed on ATV's. Base members are connected to cross members of installed racks by means such as U-bolts 21 (Fig.3) provided at each corner

Vertical posts 24, 24a are preferably made up of two parts, a lower portion 30, 30a connected to a base member at the center of the length thereof and extending upward for a length of about one half of the post and an upper portion 32, 32a sized to fit within the lower portion for sliding movement therein for making vertical adjustments. The upper portion may have a

length sufficient to allow the top of the vertical posts to be located a distance such as three feet above the base members. In order to hold the upper portion at a selected height the lower portion may have a pair of holes 34, 34a and 35, 35a extending across and receiving bolts 27, 27a and 23, 23a engaged by lock nuts 29. The upper portions 32, 32a of the vertical posts are preferably provided with a series of holes 37 (Fig. 3) at spaced-apart locations allowing selection of a pair of the holes enabling insertion of bolts at an elevation providing a desired height for the end assemblies. Vertical adjustments using this feature may be used to fit the available space to the height of the driver of the ATV.

Upper portions 32, 32a of the vertical posts have their top ends connected to middle portions 42, 42a of the cross members, the middle portion extending for a distance such as two feet. End portions 22, 22a are L-shaped members having one arm 48, 48a inserted in an outer end of middle portion 42, 42a and the other arms 22, 22a extending upwards, providing a barrier to keep a supported object from sliding off. Connection of end portions 22, 22a to middle portions 42, 42a are preferably made by insertion of bolts 43 through an opening in a side of this portion and engaging a jam nut 44 and a weld nut 45 underneath the jam nut as shown in Fig. 4. Varying the length of the cross member may be carried out by loosening the bolts and sliding end portions inward or outward in the middle portion. Unlike the vertical post connections described above, this connection does not require insertion of a bolt all the way through the middle portion.

Beam 16 is preferably made up of three parts: stubs 50, 50a connected to the middle portions of the cross members by means such as a bolt 53, 53a , beam portions 55, 55a and a middle sleeve member 52 which receives middle ends of portions 55, 55a . The sleeve is connected to the beam portions by bolts 54, 54a extending through the beam. Unlike the joints for vertical posts, this connection is preferably left to be made by custom fitting through a single hole in each of the inner ends for being connected to the sleeve. This approach avoids the presence of a series of bolt holes, which could result in weakening the beam.

Each of the lower portions of the posts has a bracket 56, 56a connected to the lower end of the post, the bracket provided with openings 57, 57a for receiving a strap (not shown) wrapped around a boat or other object and securing it in position. A second bracket 58, 58a may be provided on the upper portion of the vertical posts, these brackets having openings 60, 60a for receiving additional straps if necessary. The straps may include a ratcheting device for tightening and one or more S hooks for engaging the openings in the brackets.

Metal loops 70, 70a may be connected to the base members to provide for receiving other tie-down ropes or the like as may be needed to secure other transported objects in place. Similar loops 71 are provided on cross members 20,20a.

As shown in Fig. 3, U-bolts 72, 72a and 21, 21a are preferably used to connect the base members to front and rear racks to an ATV. The U-bolts may be provided with sufficient slack to allow connection with underlying rack

rack members that extend in either a direction generally parallel to the base members or in a direction perpendicular to the base members. The U-bolts are preferably located near to the ends of the base members, and the metal loops may be placed inside of the U-bolts.

Boat-supporting accessory racks embodying the invention may also be installed on the bed of a pickup truck, with adjustments being made to fit onto the truck bed. The length of the beam would depend on the length of the bed. Connection of the base members to the truck may be carried out use of four bolts, one at each corner. As shown in Fig. 5, base members 18, 18a are bolted to the truck bed 74 by bolt 76, which also passes through bed liner 77.

Although the invention is illustrated for use in transporting boats, it is to be understood that other watercraft such as canoes and kayaks are included within this terminology. Other objects such as lumber, posts and other building material and similar products may also be transported by use of the invention.